

**Size:** 5,226 acres  
**Mission:** Provided tactical fighter operations support  
**HRS Score:** 33.62; placed on NPL in February 1990  
**IAG Status:** Federal Facility Agreement signed in October 1990  
**Contaminants:** Petroleum/oil/lubricants, VOCs, and lead  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$71.7 million  
**Estimated Cost to Completion (Completion Year):** \$59.0 million (FY2031)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY1999



Victorville, California

## Restoration Background

Environmental studies conducted at George Air Force Base since FY81 have identified the following site types: landfills, petroleum spill sites, underground storage tanks (UST), waste storage and disposal units, and fire training areas. Chlorinated solvents, such as trichloroethene (TCE) and tetrachloroethane, have migrated from sites and have contaminated groundwater and soil. Sites were subsequently grouped into three operable units (OU).

Remedial Investigation and Feasibility Study (RI/FS) activities began in FY84 and have been accelerated by the use of field screening techniques. The installation has completed Relative Risk Site Evaluation at all sites.

In FY91, the installation implemented an Interim Remedial Action (IRA) at OU1. In FY93, IRAs were in progress at OU1 and OU2. Other Interim Actions at the installation included removal of more than 80 USTs and contaminated soil and cleanup and closure of a hazardous waste storage yard.

In FY91, a RCRA Facility Assessment identified 113 solid waste management units. In FY92, the installation prepared an Engineering Evaluation and Cost Analysis and installed a pumping system at OU2. In FY93, the installation completed a final draft FS and a Proposed Plan for OU1 and began an Environmental Baseline Survey. In FY94, the Air Force and regulatory agencies signed a final Record of Decision (ROD) for OU1.

In FY95, the installation removed 30 oil-water separators and associated contaminated soil, began operation of bioventing systems at seven fuel-contaminated sites, and removed and disposed of soil from a low-level radioactive waste disposal site. All basewide RI/FS fieldwork was completed, and a draft report was issued. The installation selected cleanup actions for all sites.

In FY96, the installation began construction of landfill-surface rehabilitation projects and continued TCE cleanup actions at OU1. These cleanup actions involved the installation of additional groundwater extraction wells. Mobile recovery units were developed for use at OU2 to remove JP-4 jet fuel from contaminated groundwater. In addition, removal of the liquid fuel distribution system and of all USTs was completed. The installation also began cleanup by bioventing at six fuel spill sites. Completion of the RI/FS and signing of the basewide ROD were on hold, pending review by the regulatory agencies.

A BRAC cleanup team (BCT) was formed in FY92, and the installation's technical review committee was converted to a restoration advisory board (RAB) in FY94. The installation closed on December 15, 1992. The installation has continued to hold scheduled meetings with the RAB throughout FY96 and has worked with the Local Redevelopment Authority to lease major remaining parcels of land.

The installation began construction of landfill-surface rehabilitation projects and continued TCE cleanup actions at OU1 that involved the installation of additional groundwater extraction wells. Mobile recovery units were developed for use in OU2 to remove JP-4 jet fuel from contaminated groundwater. In addition, removal of the liquid fuel distribution system and all USTs was completed. The installation also began cleanup by bioventing at six fuel spill sites.

Work on the RI/FS continued. However, completion of the RI/FS and signing of the basewide ROD were not accomplished because review by the regulatory agencies had not been completed.

## FY97 Restoration Progress

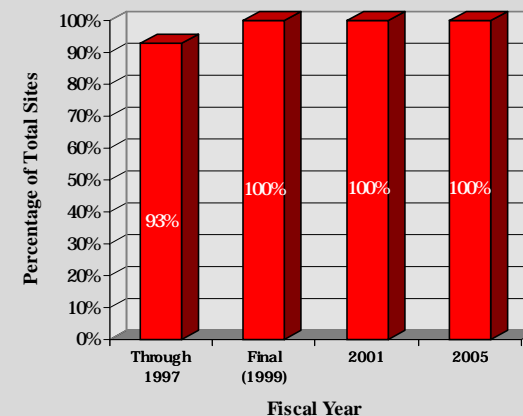
The installation completed construction of all landfill closures and landfill-surface rehabilitation projects. In addition, it continued TCE cleanup at OU1, bioventing cleanup at six fuel spill sites, and free-product recovery and long-term monitoring (LTM) at OU2. The installation also documented over 2,500 acres as CERFA-clean.

Partnering with the community and with regulatory agencies was promoted through RAB efforts and annual scheduled meetings. The RAB focused on activities that would increase community response and involvement. The BCT continues to meet monthly. The OU2 Treatability Study and FS were not completed, which in turn delayed the basewide ROD.

## Plan of Action

- Complete bioventing sites and remove wells in FY98
- Complete removal of lead shot at isolated shooting range in FY98
- Complete Remedial Design and Remedial Action for last OU3 site (OT-51) in FY98
- Conclude the groundwater modeling Treatability Study for OU2 and issue an FS in FY98
- Continue TCE cleanup of OU1 and complete installation of additional groundwater extraction wells in FY98
- Complete all remedial construction in FY98
- Complete RI/FS in FY98 and sign a basewide ROD in FY99
- Complete removal of free product in OU2 by FY00
- Continue LTM and long-term operations at OU2 through FY31

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**Size:** 1,285 acres (1,121 acres at Glenview; 164 acres at Libertyville)

**Mission:** Provided accommodation for aircraft, conducted flight and general training, and served as a NIKE missile location (Libertyville site)

**HRS Score:** NA

**IAG Status:** None

**Contaminants:** Petroleum hydrocarbons, heavy metals, PCBs, solvents, asbestos, and waste activated sludge

**Media Affected:** Groundwater, surface water, sediment, and soil

**Funding to Date:** \$19.3 million

**Estimated Cost to Completion (Completion Year):** \$13.8 million (FY2000)

**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2000



*Glenview, Illinois*

## Restoration Background

In July 1993, the BRAC Commission recommended closure of Glenview Naval Air Station and the Libertyville Training Site. Closure occurred in FY95.

Glenview was established in 1937 to provide accommodations for Service aircraft. In World War II, the station was used for flight training. In 1946, it became a Reserve Command training facility. Libertyville was a flight training site and a NIKE missile air defense location.

Forty-three sites have been identified at the two bases: 33 CERCLA sites and 2 underground storage tank (UST) sites at Glenview; 7 CERCLA sites and 1 UST site at Libertyville. Of the sites identified, those that present the greatest risk are fire-fighter training areas, landfills, fuel storage areas, and areas where waste was disposed of on the land surface.

In FY88, a Preliminary Assessment Study identified six potentially contaminated sites at Glenview. A Site Inspection (SI) completed in FY92 identified three more sites at Glenview. Between FY92 and FY94, the installation completed an Interim Removal Action for five of seven identified CERCLA sites at Libertyville. During FY94, an Environmental Baseline Survey was completed for Glenview and Libertyville.

Because Glenview is 18 miles from the Libertyville Training Site, two separate local communities are involved with these sites, necessitating the formation of two restoration advisory boards. The installation prepared a community relations plan for Libertyville in FY93 and one for Glenview in FY95. The BRAC cleanup team (BCT), formed in FY93, works closely with the two Local Redevelopment Authorities

(LRA), which also formed in FY93. A BRAC Cleanup Plan was completed in FY94, and a land reuse plan was completed in FY95.

During FY95, an SI was completed at Glenview Site 8. The installation initiated SI activities at 16 Glenview sites and Remedial Investigation and Feasibility Study (RI/FS) activities at 4 Glenview sites.

In FY96, the installation completed removal of all USTs from Glenview, initiated SIs at three sites, and replaced contaminated soil with clean fill in parts of the airfield. The installation also prepared a finding of suitability to transfer (FOST) for Glenview Golf Course and began developing a FOST for the majority of the airfield property.

## FY97 Restoration Progress

Restoration activities performed by the installation included initiation of an SI at 7 sites in Libertyville, initiation of an RI and an Interim Remedial Action (IRA) at 7 sites in Glenview, completion of an SI at 20 sites in Glenview, and completion of all UST removals at 1 site in Glenview.

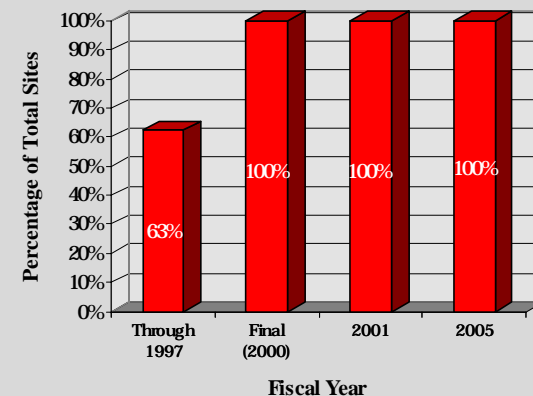
The Navy implemented a formal partnering agreement with regulatory agencies and conducted training for facilitated meetings. Partnering with regulatory agencies also assisted in setting priorities and regularly communicating with the LRA to coordinate cleanups. The BCT approved a FOST for 535 acres of the former airfield at Glenview. Also at Glenview, 120 acres of property have been leased. A FOST for an additional 80 acres was initiated in FY97.

Some sites scheduled for remediation in FY97 were found to require no further action. Some actions at other sites were delayed because of the need for further site characterization and changes in plans to suit reuse.

## Plan of Action

- Complete an SI at five sites at Glenview and seven sites at Libertyville in FY98
- Initiate an RI at one site at Glenview and four sites at Libertyville in FY98
- Complete RI at two sites at Glenview in FY98
- Initiate an IRA at seven sites at Glenview and four sites at Libertyville in FY98
- Complete IRA at six sites at Glenview in FY98
- Complete UST removal at one site at Libertyville in FY98
- Complete an RI at two sites at Libertyville in FY99
- Initiate an IRA at three sites at Libertyville in FY99
- Complete an IRA at three sites at Libertyville and four sites at Glenview in FY99
- Complete an SI at three sites at Glenview in FY99
- Complete an RI at five sites at Glenview in FY99

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**Size:** 3,552 acres  
**Mission:** Operate air refueling and long-range bombardment facility  
**HRS Score:** 34.20; placed on NPL in July 1987  
**IAG Status:** Federal Facility Agreement signed in June 1990  
**Contaminants:** VOCs, heavy metals, PCBs, grease, degreasers, caustic cleaners, dyes, penetrants, pesticides, and solvents  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$81.8 million  
**Estimated Cost to Completion (Completion Year):** \$48.7 million (FY2031)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2001



*Rome, New York*

## Restoration Background

In FY81, a Preliminary Assessment and a Site Inspection identified 54 sites at Griffiss Air Force Base. Site types include landfills, underground storage tanks (UST), fire training areas, disposal pits, and spill areas. Releases of polychlorinated biphenyls (PCB), volatile organic compounds (VOC), pesticides, metals, and petroleum products have occurred at those sites and have caused contamination of soil, groundwater, and surface water. Possible off-site groundwater contamination was identified.

Interim actions conducted at the facility between FY86 and FY91 included modification of a landfill cap and removal of contaminated soil and USTs from a tank farm, various disposal pits, and the area adjacent to an aircraft nosedock. During FY91 and FY92, as an Interim Remedial Action (IRA), an \$8 million alternative water distribution system was constructed to serve community residents outside of the installation. Remedial Investigation (RI) Reports on areas of concern (AOC) were completed in FY93.

In FY95, work began on numerous UST closures and contaminated soil removals. Contracts for closures under RCRA and contracts for the closure of fuel distribution systems were awarded. The installation also completed a draft Environmental Impact Statement (EIS) and an Environmental Baseline Survey (EBS). The installation received concurrence on 45 of the 1,150 acres proposed as uncontaminated.

In FY95, a BRAC cleanup team (BCT) and a restoration advisory board (RAB) were formed. A Local Redevelopment Authority (LRA) was formed to address socioeconomic issues related to closure of the installation. During FY95, a final reuse plan was submitted.

In FY96, the installation presented the Relative Risk Site Evaluation (RRSE) to the members of the RAB for questions and comments. The RAB concurred with the RRSE process for determining priorities.

The installation completed the EIS in November and issued a final reuse Record of Decision (ROD) for the BRAC III realignment. The BRAC IV realignment ROD was deferred.

In FY96, 96 of the 210 UST sites and hydrant fuel systems were closed. Confirmatory sampling was completed for closure of all 48 RCRA sites. Comments on the RI report for the 31 AOCs were received from the regulatory agencies. In March 1996, the installation began Feasibility Study (FS) activities. Design work began for an IRA at seven AOCs. Samples were collected at 30 sites and 470 sites were screened under the Area of Interest program, which identifies potential sites.

## FY97 Restoration Progress

The final RI Report for 31 AOCs (Federal Facility Agreement sites) was completed. EPA does not concur with all sites. Thirteen draft Proposed Plans for no further action were submitted. The Proposed Plans cover no-further-action for soil at 12 sites and no-further-action for the off-base groundwater. Supplemental investigations have begun. The FS process began with submission of the draft Remedial Alternative Development and Screening Report. IRAs have begun at eight sites.

Cleanup is proceeding for RCRA sites that failed initial screening; however, a lack of funding has prevented actions on two sites.

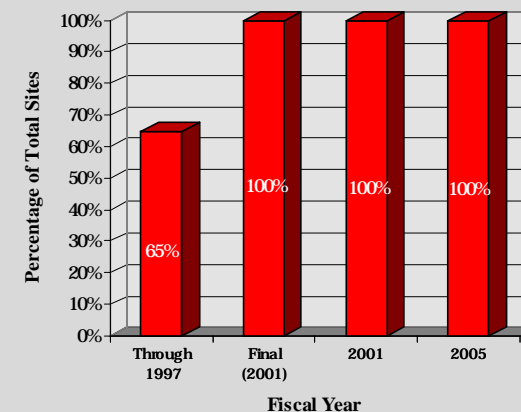
Under the Area of Interest program, 32 of the 470 areas are listed as confirmatory sampling sites. Of these 32 sites, 12 will enter the Expanded Site Inspection (ESI) stage, 17 sites are proposed for no further action, and 3 sites will be closed under other programs.

Oil-water separator closure is under way. The UST removal program continues.

## Plan of Action

- Complete IRAs for seven sites
- Complete the AOC supplemental investigation
- Complete the area of interest ESI
- Begin the AOC designs
- Begin the area of interest FS and designs
- Begin the close-spill-site program
- Initiate the baseline for long-term monitoring
- Complete soil remediation for the RCRA closures
- Begin airfield closure (BRAC IV)
- Complete BRAC IV EBS/EIS

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**Size:** 2,722 acres  
**Mission:** House a refueling wing; formerly housed a bombardment wing  
**HRS Score:** NA  
**IAG Status:** None  
**Contaminants:** Household and industrial waste, spent solvents, fuels, waste oil, pesticides, lead, silver, munitions, asbestos, and lead-based paint  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$10.5 million  
**Estimated Cost to Completion (Completion Year):** \$2.5 million (FY2003)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY1999



## Peru, Indiana

### Restoration Background

In July 1991, the BRAC Commission recommended realignment of Grissom Air Force Base. Following realignment, some 1,300 acres will be returned to the community for redevelopment. The Air Force retains approximately 1,400 acres for military activities. The installation was realigned in September 1994.

Sites identified include underground storage tanks (UST), a hydrant system, fire training areas, landfills, a fuel-sludge weathering site, a munitions burn and burial area, a small-arms firing range, oil-water separators, and various petroleum-contaminated sites from former leaking USTs. Remedial Investigation and Feasibility Study activities began in FY89.

Interim Actions have included removal of 63 USTs and associated petroleum-contaminated soil and use of soil bioremediation, air sparging, removal of free product, and natural attenuation to effect cleanups. Significant cleanups include completion of clean-closure at UST removal sites and completion of no-further-action documents for 13 areas of concern (AOC) and one Installation Restoration Program (IRP) site.

In FY94, the installation formed a BRAC cleanup team (BCT) and prepared a BRAC Cleanup Plan. In FY95, the installation formed a restoration advisory board (RAB). The installation also proposed one acre as CERFA-clean and completed supplemental Environmental Baseline Surveys on specific parcels with the intention of leasing or redeveloping the property.

Also in FY95, the installation began ex situ bioremediation and natural attenuation and reduced investigative costs by efficiently using geoprobe sampling at 31 former UST sites. The installation also began site characterization and corrective action plans for UST sites in the

Military Family Housing Area and at the BX gas station. Regulatory agencies have been involved since the start of planning and decision making and have provided comments on proposed cleanup actions before their implementation.

During FY96, the installation held quarterly RAB meetings and continued accomplishing significant soil removal and bioremediation. Priorities for cleanup activities were established and the installation applied cleanup criteria based on risk to human health to close specific sites without remediation. The installation developed a Focused Feasibility Study to fill specific data gaps and continued investigation and closure of AOCs. An Economic Development Conveyance was signed in May 1996, and concurrence on CERFA-clean acreage was received from the regulatory agencies.

### FY97 Restoration Progress

The first finding of suitability for early transfer (FOSET) was accomplished, and 201 acres were transferred to the state of Indiana for construction of a state prison before environmental cleanup on the parcel was complete. Long-term monitoring (LTM) of groundwater began. Investigation and closure of AOCs continue.

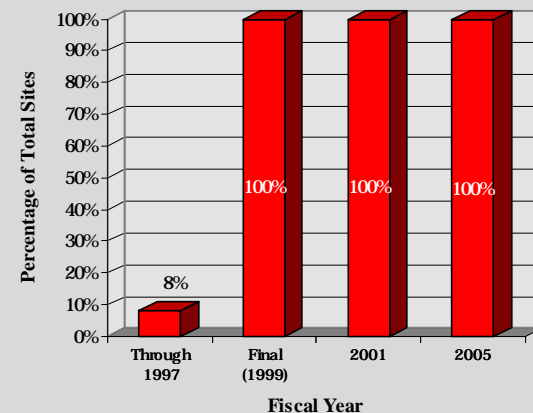
The BCT reached a consensus on Remedial Action (RA) for landfills, and work on the revised decision document began. To help resolve issues with the regulatory community, the BCT established ground rules for its meetings. It also oversaw three major investigations and removed the 12 remaining USTs.

An investigative study for fire protection areas and explosive ordnance disposal (EOD) for the former munitions burn and burial area, both originally scheduled for completion in FY97, will be completed in FY98.

### Plan of Action

- Sign RA decision document for landfills in FY98
- Continue closeout of AOCs in FY98
- Reach consensus on RA and sign decision document for fire protection training areas in FY98
- Complete finding of suitability to transfer (FOST) for the remainder of the property in FY98
- Complete RA for former leaking USTs in FY98
- Finish EOD and environmental work at former munitions burn and burial area in FY98
- Resolve dispute with regulators over closure of the Firing in Buttress site in FY98
- Optimize LTM in FY98
- Resolve RCRA Interim Hazardous Waste Storage Site closure in FY98
- Complete investigation and Engineering Evaluation and Cost Analysis of trichloroethene contamination at Oil-Water Separator 896 in FY98
- Complete investigation and cleanup of the small-arms firing range in FY98

### SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**Size:** 18,253 acres  
**Mission:** Maintained and operated facilities, provided services and materials, and stored and issued weapons and ordnance in support of the operating forces of the Navy and shore activities; provided dry-dock facilities, repair services, and related services for Guam Naval Activities  
**HRS Score:** NA  
**IAG Status:** IAG signed in 1993  
**Contaminants:** PCBs, petroleum/oil/lubricants, and heavy metals  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$75.8 million  
**Estimated Cost to Completion (Completion Year):** \$75.2 million (FY2029)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2001



*Apra Harbor, Guam*

## Restoration Background

This facility consists of Navy commands in the Apra Harbor area and the former Naval Magazine (NAVMAG) area southeast of the harbor. Four of the commands—Guam Naval Activities (NAVACTS), Naval Fleet and Industrial Supply Center (FISC), Naval Ship Repair Facility (NSRF), and Public Works Center (PWC)—were recommended for realignment or closure by the BRAC Commission in July 1995.

Typical operations that contributed to contamination were support, photographic and printing shops, a dry-cleaning plant, power plants and boilers, pest control operations, and chemical and medical laboratories. Wastes were stored and disposed of in landfills, incinerators, and wastewater treatment plants.

Combined, the four commands have 29 CERCLA sites in the Installation Restoration Program and 26 RCRA sites, 3 of which were transferred to BRAC. Of the CERCLA sites, three are in the study phase of a Remedial Investigation and Feasibility Study (RI/FS), eight are scheduled for the study phase in FY04, one is in the cleanup phase, and five are in the study phase of an Interim Removal Action. Of the RCRA sites, 20 are in the RCRA Facility Investigation and corrective measures study (CMS) phase. Five Removal Actions have been completed and a Human Health Risk Assessment and an Ecological Risk Assessment have been prepared for NAVACTS, PWC, FISC, and NSRF.

The complex converted its technical review committee, formed in FY89, to a restoration advisory board in FY95. The complex also completed a joint community relations plan (CRP) in FY92. A local information repository was established in FY94.

During FY96, the installation's BRAC cleanup team (BCT) convened for the first time and completed an Environmental Baseline Survey (EBS) and a BRAC Cleanup Plan (BCP) for all four activities.

## FY97 Restoration Progress

The facility ceased operations in September 1997. During FY97, a Removal Action continued at PWC Site 16, the Interim Remedial Action (IRA) phase continued at several sites, and cleanup occurred at one site. As the draft Engineering Evaluation and Cost Analysis (EE/CA) was completed and the Action Memorandum was prepared and signed, fieldwork began at FISC under the IRA for Site 19.

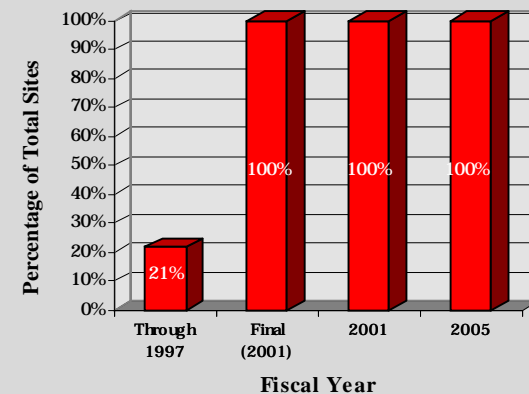
Initiation and implementation of a Memorandum of Understanding between regulators and the Navy resolved issues with regulatory agencies and expedited document review and site characterization. The BCT completed the EBS and began a BCP for new sites. It also conducted a joint site visit, completed a finding of suitability to lease (FOSL) for both NSRF and COMNAVAMARIANAS parcels, began preparing a CRP, completed resampling of suspect data, and expanded an RI into adjacent wetlands. A draft of the BCP and EBS for NAVACTS sites was completed. Regulatory agencies approved the designation of 1,300 acres as CERFA-uncontaminated.

Some activities scheduled for completion in FY97 were delayed because of funding constraints and regulatory holdups.

## Plan of Action

- In FY98, complete CMS and Corrective Measures Design (CMD) for solid waste management units (SWMU) at NAVACTS
- Begin CMD for SWMUs at NSRF in FY98
- Complete CMD for several SWMUs at NSRF and begin corrective measures implementation phase in FY98
- Conduct Removal Action at NSRF Site 25 in FY98
- Complete EE/CA and prepare design of Removal Action for Site 19 at FISC in FY98
- Complete Removal Action and begin RI to complete characterization of Site 16 at PWC in FY98
- Complete RI for Site 17 at PWC
- Complete Removal Action design package and begin Removal Action for Site 2810 at PWC in FY98
- Complete design and begin construction for Removal Action at NAVACTS Site 1 in FY98
- Complete Removal Action for NAVACTS Sites 4 and 14 in FY98

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR





**Size:** 722 acres  
**Mission:** Conducted reserve training  
**HRS Score:** NA  
**IAG Status:** None  
**Contaminants:** Metals, VOCs, SVOCs, fuel hydrocarbons, PCBs, PAHs, and pesticides  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$17.1 million  
**Estimated Cost to Completion (Completion Year):** \$0.7 million (FY2003)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2000



## Novato, California

### Restoration Background

In December 1988, the BRAC Commission recommended closure of about 700 acres at Hamilton Army Airfield (HAAF), as well as relocation of the airfield's mission. There are eight discrete areas at the installation: a former petroleum/oil/lubricant (POL) hill area; a hospital complex; five additional areas, identified as Out Parcels A-2, A-3, A-4, A-5, and A-6; and the main airfield parcel. Out Parcels A-2, A-3, A-5, and A-6 were transferred to the city of Novato, California, in 1996.

Previous investigations at the main airfield parcel addressed tidal wetlands, a perimeter drainage ditch, underground storage tanks (UST), burn pits, aboveground storage tanks, onshore and offshore fuel lines, a former sewage treatment plant, a pump station, an aircraft maintenance and storage facility, the east levee construction debris disposal site, a POL area, and a revetment area. Metals, petroleum hydrocarbons, volatile organic compounds, semivolatile organic compounds (SVOC), pesticides, and polychlorinated biphenyls (PCB) are the main contaminants of concern.

In FY94, the installation formed a BRAC cleanup team (BCT) and a restoration advisory board (RAB). To help facilitate cleanup, the BCT conducted a "bottom up" review of the installation's restoration program. Since FY94, the BCT has met monthly to discuss environmental restoration efforts, receive briefings on the restoration program, and review documents.

During FY95, the installation completed a draft Environmental Impact Statement. Additional Remedial Investigation (RI) work also continued at five sites. Cleanup actions conducted at the installation included removal of USTs and removal of soil contaminated with

petroleum constituents and PCBs. In November 1996, the local reuse authority selected a wetlands reuse scenario for the BRAC airfield parcel.

The RAB meets monthly to discuss current restoration activities and issues related to property reuse. The RAB is a mechanism for the Army for communicating with and providing information to the public. Local citizens of all economic levels continued to be solicited to serve as members of the RAB.

In FY96, the Army continued the RI/Feasibility Study (FS) activities on the main airfield BRAC parcel. Out Parcels A-5 and A-6 were transferred to a local development group.

### FY97 Restoration Progress

The installation continued RI fieldwork. Two USTs were removed. The HAAF BCT, consisting of Army, the U.S. Army Corps of Engineers, the BRAC environmental coordinator office, and regulatory agencies, worked to expedite cleanup by using a data-quality-objective approach to site characterization.

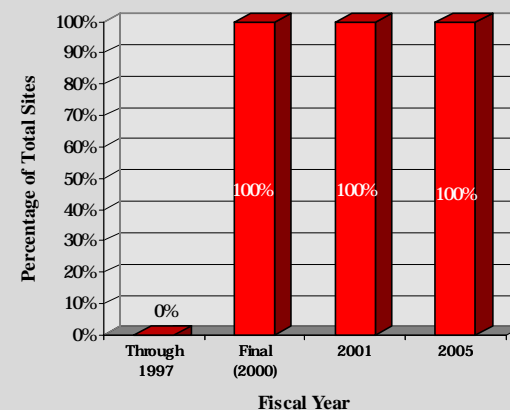
The draft Human Health and Ecological Risk Assessments, scheduled for completion in FY97, were delayed so that new exposure scenarios and RI data could be incorporated.

### Plan of Action

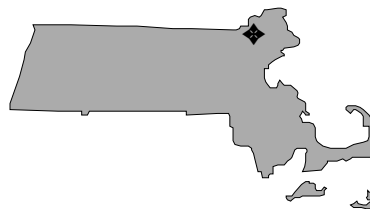
- In FY98, complete an RI Report, a Human Health Risk Assessment, an Ecological Risk Assessment, and a draft Focused Feasibility Study
- Complete the Remedial Design for the onshore fuel line at the BRAC airfield parcel in FY98

- Develop closure reports for Out Parcel A-4 in FY98
- Complete all BRAC activities by FY00, with long-term groundwater monitoring of the POL hill area until 2010

### SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**Size:** 826 acres  
**Mission:** Support Electronic System Center  
**HRS Score:** 50.00; placed on NPL in May 1994  
**IAG Status:** None  
**Contaminants:** VOCs, chlorinated solvents, gasoline, jet fuel, tetraethyl lead, PCBs, and mercury  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$28.3 million  
**Estimated Cost to Completion (Completion Year):** \$24.5 million (FY2020)  
**Final Remedy in Place or Response Complete Date:** FY2000



*Bedford, Massachusetts*

## Restoration Background

Historical operations at Hanscom Air Force Base involved the generation, use, and disposal of numerous hazardous substances, such as chlorinated solvents, fuel, aromatic solvents, tetraethyl lead, and polychlorinated biphenyls (PCB). Possible sources of contamination at the installation include a former industrial wastewater treatment system, a former filter-bed area, a jet fuel residue and tank sludge area, two landfills, three former fire training areas, a paint waste disposal area, a mercury spill area, aviation fuel handling and storage facilities, underground storage tanks (UST), and various fuel spill areas. These sources have contaminated groundwater and soil at the installation.

In FY84, environmental studies identified 13 sites. Subsequent discoveries increased the number of sites to 22. All required actions have been completed and no further response action is planned for 13 of these sites. Site Inspections (SI) or Remedial Investigations and Feasibility Studies (RI/FS) are under way at the remaining nine sites. Interim Remedial Actions have been completed or are continuing at eight of the nine active sites.

In FY88, the final Remedial Action (RA) was completed for the closed base landfill, and Interim Actions (removal of buried drums and/or contaminated soil) were completed at three high-risk sites in Operable Unit (OU) 1. Interim Actions also were completed at the mercury release site and the UST sites. In FY89, the final RA was completed for the mercury release site.

In FY90, the installation completed Interim Actions, including removing abandoned tanks and petroleum-contaminated soil, at UST sites. In FY91, the installation began operation of the OU1 groundwater collection and treatment system to remove VOCs from groundwa-

ter and completed an Interim Action at the AAFES Service Station UST site that included removal of 2,700 tons of contaminated soil.

In FY94, the installation's technical review committee was converted to a restoration advisory board (RAB), and the installation completed a cleanup involving removal of more than 1,300 tons of contaminated soil from a former UST site.

In FY95, the installation began an Interim Action involving a dual-phase groundwater extraction and soil vapor extraction system at Site ST21 for remediation of petroleum releases.

In FY96, the installation entered into a partnership with EPA and Tufts University's Center for Field Analytical Studies and Technologies (CFAST) to support research and development efforts while filling data gaps for OU1 and for Site ST21 in OU3.

## FY97 Restoration Progress

The installation completed transition of the groundwater recovery and treatment system at OU1 to an automatic system and added two new recovery wells to the collection system. The Baseline Human Health and Ecological Risk Assessment for OU2/Site LF04 was completed, and the Massachusetts Contingency Plan (MCP) documentation was filed to establish natural attenuation and intrinsic remediation as the final remedy for the AAFES Service Station UST site.

The installation continued Human Health and Ecological Risk Assessments for OUs 1 and 3. Projects with EPA and Tufts University at OU1 and at Site 21 in OU3 continued. The installation is being used as a demonstration site for Armstrong Laboratory's direct-push monitoring point and direct-push data mapping technology. Massachusetts Institute of Technology is using Site ST21 to develop laser induced fluorescence technology.

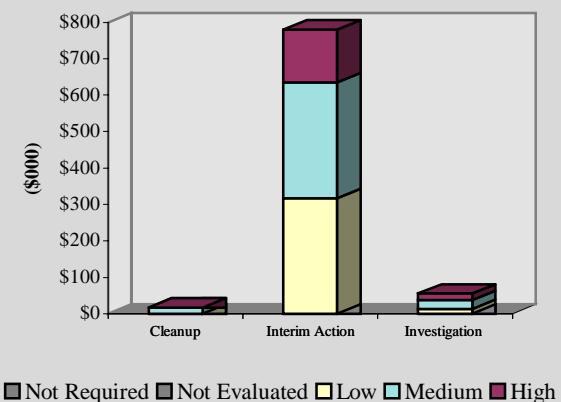
The installation conducted three RAB meetings in FY97. The RAB was briefed on ongoing investigations, actions, and reports.

The decision document for OU2 was not needed because EPA accepted the original no-further-action decision document. The IRA scheduled for Site 6 of OU3 in FY97 was not performed because the level of risk shown in preliminary RI data did not justify it. Delays in other activities for FY97 were due to technical problems. These activities have been rescheduled for FY98.

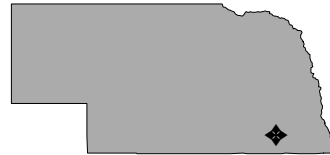
## Plan of Action

- Complete SI at two UST sites and RI at the two sites in OU3 in FY98
- Complete Human Health and Ecological Risk Assessments for OU1 and OU3 in FY98
- Complete the MCP process to establish natural attenuation and intrinsic remediation as the final remedy for the Base Motor Pool UST site in FY98
- Host an Air Force technology transfer project to demonstrate vacuum-enhanced recovery of chlorinated hydrocarbons from groundwater at Site FT01 in OU1
- Continue the FS and Record of Decision processes for OU1 and OU3 in FY98
- Continue operating the groundwater recovery and treatment system for OU1 and the dual-phase recovery and treatment system for Site ST21 in OU3

## FY98 FUNDING BY PHASE AND RELATIVE RISK



**Size:** 48,753 acres  
**Mission:** Produce, load, and store ammunition  
**HRS Score:** 42.24; placed on NPL in June 1986  
**IAG Status:** IAG under negotiation  
**Contaminants:** Explosive compounds, UXO, VOCs, PAHs, and heavy metals  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$43.3 million  
**Estimated Cost to Completion (Completion Year):** \$188.7 million (FY2030)  
**Final Remedy In Place or Response Complete Date:** FY2003



### Hastings, Nebraska

### Restoration Background

Previous operations at the Blaine Naval Ammunition Depot subsite contributed to groundwater and soil contamination at the Hastings Groundwater Contamination Site. The U.S. Army Corps of Engineers (USACE) designated five operable units (OU) at the site: three OUs for the 2,900-acre Hastings East Industrial Park (HEIP) area (OU4, soil; OU8, vadose zone; and OU14, groundwater); one OU for the former location of the Naval Yard Dump, the Explosives Disposal Area, and the Bomb and Mine Complex Production Facility (OU16); and one OU covering a 44,500-acre area whose contamination status is unknown (OU15).

Soil sampling, installation of monitoring wells, and geophysical surveys were conducted for the Remedial Investigation (RI) of the HEIP area. EPA signed a Record of Decision (ROD) to remove surface soil; however, predesign studies for the selected Remedial Action (RA) revealed the need for modification of some aspects of the remedy. Remedial Design (RD) activities included soil vapor extraction (SVE) and an air sparging pilot study. In FY95, EPA signed an amendment to the ROD for the removal of soil from the HEIP area.

RI, Feasibility Study (FS), and RD activities have been conducted for two OUs. A Time-Critical Removal Action was conducted in the area where the air sparging pilot study was conducted, to remove utility accesses and piping that had been identified as a source of the groundwater contamination. Engineering Evaluations and Cost Analyses (EE/CA) also were performed to assess alternatives for environmental restoration in several areas. USACE also completed a preliminary environmental study for the remaining 44,500 acres at the former depot.

A Federal Facility Agreement was based on an agreement among EPA, the Nebraska Department of Environmental Quality, and DoD. The

Army signed the agreement on 30 September 1997, and signatures by other agencies are pending.

In FY96, the RD for SVE and remediation of surface soil at the HEIP area was completed. Phase II of the RD for SVE was initiated at three source areas at OU8. USACE completed the air sparging pilot study as part of the RI/FS for OU14 and initiated the Time-Critical Removal Action for the air sparging facility. The comprehensive RI for the remaining 44,500 acres at the former depot was initiated. A Time-Critical Removal Action of subsurface soil and drums was conducted at the Naval Yard Dump. In addition, an RA of surface soil at the HEIP area and a Removal Action at the HEIP area were initiated.

### FY97 Restoration Progress

A sitewide groundwater Baseline Risk Assessment was initiated. USACE will pursue air sparging with in situ bioremediation capabilities in FY97; this innovative technology will be constructed in FY97. USACE employed the accelerated fieldwork techniques of shallow and deep soil gas sampling and testing, as well as preplaced RA, co-reimbursable, and indefinite-delivery contracts to expedite contracting and the cleanup process.

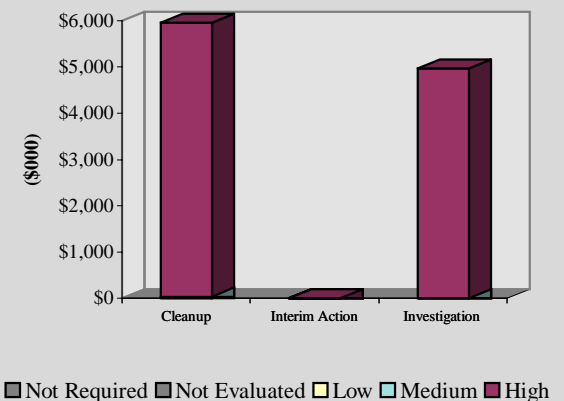
The former DoD property's restoration advisory board (RAB) conducted quarterly meetings with 20 members of varying backgrounds. RAB emphasis has been on familiarizing the members with the site and with ongoing work. Members participated in a site tour and basic risk assessment training.

Some activities scheduled for completion in FY97 were delayed because of increased regulatory review time, and the OU8 RD schedule was extended to take advantage of lessons learned from the operation of the Phase I SVE systems.

### Plan of Action

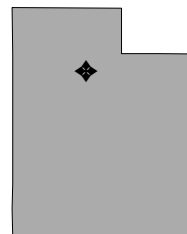
- Complete OU4 RA in FY98
- In FY98, continue system operation for SVE Phase I sites at OU8
- In FY98, complete design and award construction contract to TERC for SVE Phase II sites in OU8
- In FY98, complete final RI and submit Baseline Risk Assessment for OU15 and initiate EE/CA (and additional investigations) for selected OU15 sites
- Submit work plan for OU16 RI in FY98
- In FY98, construct in situ bioremediation system and in-well stripping and groundwater recirculation system for OUs 8 and 14; continue operation as a Removal Action in FY98
- Initiate sitewide groundwater FS for OU14 in FY98
- Revise Baseline Risk Assessment for groundwater in FY98
- Complete RI for the remaining 44,500 acres in FY98
- Continue groundwater monitoring in FY98

### FY98 FUNDING BY PHASE AND RELATIVE RISK





**Size:** 6,666 acres  
**Mission:** Provide logistics support for weapons systems  
**HRS Score:** 49.94; placed on NPL in July 1987  
**IAG Status:** IAG signed in April 1991  
**Contaminants:** Solvents, sulfuric acid, chromic acid, metals, and petroleum wastes  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$103.7 million  
**Estimated Cost to Completion (Completion Year):** \$270.9 million (FY2047)  
**Final Remedy in Place or Response Complete Date:** FY2007



## Ogden, Utah

### Restoration Background

Between FY82 and FY87, Preliminary Assessment and Site Inspection activities were completed at Hill Air Force Base. Since FY87, 97 sites have been identified. Forty of these sites have been grouped into nine operable units (OU). Site types include disposal pits, landfills, surface impoundments, underground storage tanks (UST), fire training areas, firing ranges, discharge and wastewater ponds, a contaminated building, a munitions dump, and spill sites. Contaminants consist primarily of volatile organic compounds (VOC).

The base installed five systems to treat groundwater, capped two landfills at OU1, capped one of the discharge and wastewater ponds at OU3, and recovered and treated trichloroethene (TCE)-contaminated groundwater at OU6.

In FY95, the installation began work on the Remedial Investigation and Feasibility Study (RI/FS) for OUs 5 and 6 and implemented Phase I of the Interim Remedial Action at OU8. The installation has completed decision documents for 66 sites, signed Records of Decision (ROD) for five of nine OUs, and signed two Interim RODs.

In FY96, the installation demonstrated nine technologies that will enhance and speed cleanup of heavily contaminated chemical pits. The installation continued working with the public to resolve concerns about landfills at OU1 and facilitate the completion of the FS. A ROD was signed for Chemical Pit 3 (OU2), and construction of a containment system began. Also in FY96, four UST sites were closed. Five additional decision documents were completed, as was the ROD for OU2. The installation also completed Remedial Design and Remedial Action (RD/RA) activities at OU7. In addition, the installation completed the design and implemented the RA for upgrading the horizontal drain system at Landfill 1. RI/FS activities continued at OU8 and were completed at OU6.

The installation formed a restoration advisory board (RAB) in FY94. In FY96, the installation surveyed RAB members to determine whether the RAB is meeting its objectives for community outreach and involvement. In FY95, installation staff met with representatives of state and federal regulatory agencies to develop an approach that has reduced duplication of investigations for CERCLA and RCRA sites. Under this approach, more than 200 areas of concern were evaluated and all but 9 closed in FY97.

### FY97 Restoration Progress

A ROD was signed for OU6, and the RD phase for the OU began. Investigation activities at the Utah Test and Training Range (UTTR) continued, as did the evaluation and implementation of natural attenuation. More than 200 areas of concern in OU9 were investigated and closed, requiring no further action.

Innovative technologies, such as surfactant-enhanced removal of chlorinated solvents and steam-enhanced removal of dense nonaqueous phase liquids were used at the installation. In addition, hydropunch/geoprobe, real-time groundwater chemistry monitoring, and electromagnetic techniques accelerated fieldwork. Consolidation of treatment system operations and completion of investigations at unevaluated parts of the base under a single OU saved \$600,000 and reduced the time line by 2 years.

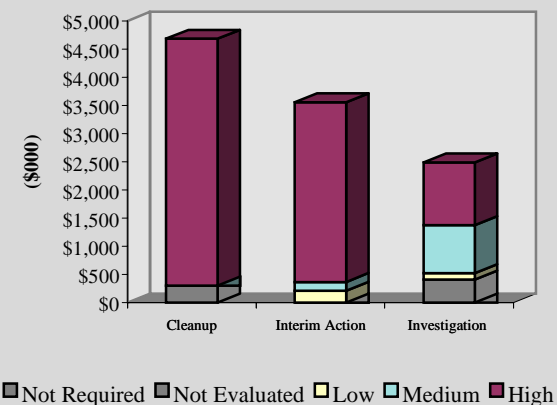
RAB meetings continued through FY97. RAB involvement in a review of the OU6 Proposed Plan provided an opportunity for early input into the groundwater collection approach. RAB comments were incorporated, reducing the estimated time to cleanup with only a marginal cost increase. The installation also implemented on-line document and design reviews with agencies to expedite document review.

Construction delays at OU2 and OU3 delayed completion of RAs for those OUs.

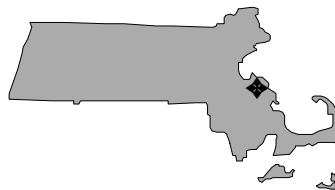
### Plan of Action

- In FY98, complete construction of a hydraulic barrier wall and groundwater interceptor trench at OU2
- Complete all RD/RA activities at OU3 and move to long-term monitoring and operation and maintenance in FY98
- In FY98, implement a partnership approach to cleanup at the UTTR to avoid unnecessary investigations and studies
- Complete a risk-based corrective action approach for all remaining UST sites in FY98
- Continue partnering efforts with EPA Region 8 and the Utah Department of Environmental Quality in FY98

### FY98 FUNDING BY PHASE AND RELATIVE RISK



**Size:** 125 acres  
**Mission:** Served as a Naval Ammunition Depot and Army Reserve Center  
**HRS Score:** NA  
**IAG Status:** None  
**Contaminants:** Petroleum/oil/lubricants, heavy metals, VOCs, PCBs, and asbestos  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$1.1 million  
**Estimated Cost to Completion (Completion Year):** \$0.4 million (FY1998)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY1998



*Hingham, Massachusetts*

## Restoration Background

In July 1995, the BRAC Commission recommended closure of Hingham Annex, a sub installation of Fort Devens. The installation currently is inactive. Previous environmental studies had identified the following types of sites: underground storage tanks (UST), aboveground storage tank sites and spill sites, waste disposal areas, sewage filter beds, storage areas for polychlorinated biphenyl (PCB)-containing transformers, and areas with asbestos-containing materials (ACM). Environmental investigations have determined that groundwater and soil are contaminated with volatile organic compounds (VOC) and heavy metals.

Interim Actions at the installation include removal of USTs, aboveground storage tanks, an oil-water separator, and contaminated soil. Other Interim Actions are removal of contaminated soil from an area that held PCB-containing electrical transformers and removal of ACM (building insulation and roofing tiles). The Army also used an innovative technology, asphalt batching, to remediate contaminated soil.

In FY93, the Army formed a BRAC cleanup team (BCT) for all Fort Devens closure activities to help streamline the restoration process. Members of the BCT include representatives of the installation and the state regulatory agency. The installation has involved the community in the restoration process by holding public meetings, publishing newsletters and a brochure, and participating in televised interviews.

During FY95, a Phase II Screening Site Inspection (SSI) was completed, and a draft Human Health and Ecological Risk Assessment was prepared. The state regulatory agency allowed the installation to proceed with the removal of soil contaminated with

petroleum/oil/lubricants (POL), pending revision of the risk assessment.

In FY96, after considering an in situ process for remediating the POL-contaminated soil, the installation decided to remove the soil. A contract was awarded for studying the two areas identified in the FY95 SSI. The installation conducted an Environmental Baseline Survey (EBS), drafted an EBS report, and received and considered comments from the regulatory agencies. The BCT completed the BRAC Cleanup Plan (BCP), Version I. The installation continued to encourage public involvement in the restoration process, but public interest was insufficient to support formation of a restoration advisory board. The Army awarded contracts for additional field sampling to support a finding of no significant risk in revised Human Health Guidelines and to conduct Ecological Risk Assessments. Another contract was awarded for removing soil in which total petroleum hydrocarbons were present in concentrations above those established by regulatory limits. The installation also distributed a progress update newsletter to all residents within a 1-mile radius of the installation.

## FY97 Restoration Progress

The final BCP was completed in FY97. Seven early actions, for asbestos removal, Building 25 AST, Building 25 Transformer Area, Waste Disposal Area, Building 54 Transformer Area, Building 90 AST and Building 90 PCB Transformer, were also completed. The installation conducted an unexploded ordnance (UXO) archives search to support a recommendation of no further action and prepared a report on the results. The installation performed release abatement measures (RAM) while conducting a Phase II Comprehensive Site Assessment (CSA) and an SSI.

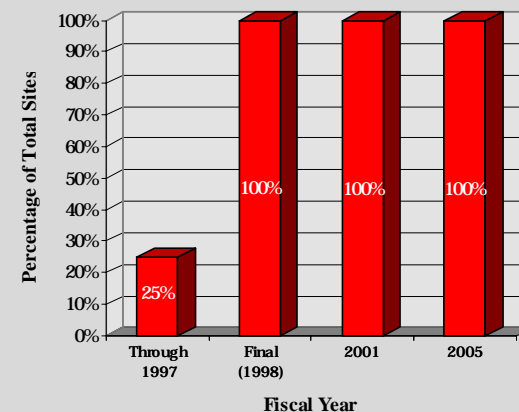
The installation began working on several projects and completed the fieldwork for several cleanup activities. These projects are currently awaiting review by regulatory agencies, the U.S. Army Corps of Engineers (USACE), or the U.S. Army Forces Command.

Some activities scheduled for completion in FY97 were delayed. Although the installation completed fieldwork for a Phase II CSA/SSI and an Environmental Assessment (EA), the Massachusetts Department of Environmental Protection has not completed its review of the Phase II CSA/SSI and the U.S. Army Forces Command has not finished reviewing the EA.

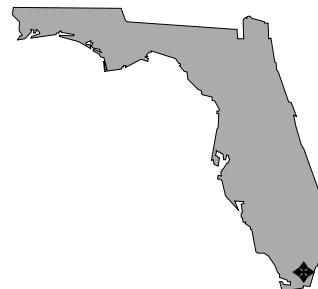
## Plan of Action

- Complete a Human Health Risk Assessment in FY98
- Perform a NEPA survey and a Cultural and Natural Resources Investigation in FY98
- Remove contaminated soil from seven sites in FY98
- Perform Removal Actions at three POL-contaminated sites in FY98
- Propose acreage as CERFA-uncontaminated and receive concurrence from the appropriate regulatory agencies in FY98

**SITES ACHIEVING RIP OR RC PER FISCAL YEAR**



**Size:** 2,940 acres  
**Mission:** Housed the Strategic Air Command 19th and 379th Bomb Wings  
**HRS Score:** 42.40; placed on NPL in August 1990  
**IAG Status:** Federal Facility Agreement signed in March 1991  
**Contaminants:** Heavy metals, VOCs, cyanide, pesticides, solvents, and PCBs  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$20.1 million  
**Estimated Cost to Completion (Completion Year):** \$15.3 (FY2010)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2000



*Homestead, Florida*

## Restoration Background

In July 1993, the BRAC Commission recommended that Homestead Air Force Base be realigned. The 31st Fighter Wing was inactivated, and all other operations except Air Force Reserve activities were relocated.

In FY86, a Preliminary Assessment and Site Inspection identified 26 sites in three major areas of concern: the fire training area, the residual pesticide disposal area, and the electroplating waste disposal area. Sites identified in previous investigations include the JP-4 jet fuel leak area, a landfill, a polychlorinated biphenyl (PCB) spill area, underground storage tanks (UST), aboveground storage tanks, and oil-water separators. Primary contaminants at the installation include heavy metals, volatile organic compounds (VOC), cyanide, pesticides, PCBs, and solvents. The contaminants have affected groundwater and soil in the area. Potential sources of contamination include more than 350 fuel storage tanks.

After experiencing hurricane damage in 1992, the installation completed an Environmental Baseline Survey (EBS) in FY94 that revealed more than 540 potentially contaminated sites. By FY95, 400 sites had been closed. In addition, over 1,000 acres were proposed as CERFA-clean. Approximately 2,052 acres are available for transfer, including the Airport Parcel.

Remedial Investigation and Feasibility Study activities began in FY87. Additional field investigations were conducted in FY92 and FY93. Interim Actions undertaken at the installation include removal of USTs and contaminated soil, groundwater extraction and treatment, and removal of oil-water separators.

By the end of FY95, the installation had completed the removal and disposal of 240 USTs, 99 aboveground storage tanks, and 142,000

cubic yards of petroleum-contaminated soil. A Removal Action for soil contaminated with lead at the fire training area in OU8 also was completed. From FY95 to the end of FY96, the installation conducted Interim Remedial Actions using hot-spot removal methodologies, voluntary maintenance, and housekeeping actions at 13 sites.

The BRAC cleanup team (BCT) holds monthly review meetings and weekly conference calls. The restoration advisory board (RAB), which was formed in FY94 and chartered in FY96, expanded to include community groups by forming the Homestead Technical Committee. The RAB, which meets bimonthly, addresses the specific concerns of members and has enabled the installation to work more closely with community groups and other government agencies. The installation and EPA have held a joint training session for RAB members on the Relative Risk Site Evaluation process.

In FY96, remaining sites identified in the FY94 EBS were consolidated into 30 OUs and 5 major fuel areas. Significant progress was made in remediating the 15 remaining sites where petroleum contamination is present, investigating 31 CERCLA sites, and removing the remaining USTs and aboveground storage tanks. The installation also transferred a 40-acre parcel of property to the U.S. Department of Labor. The cleanup of a significant portion of Parcel 6 allowed 84 acres to be transferred by deed to a local agency (the Homeless Trust).

## FY97 Restoration Progress

The installation updated the cleanup schedule to coordinate activities with the U.S. Army Corps of Engineers and the Air Force Center for Environmental Excellence. The Air Force Base Conservation Agency

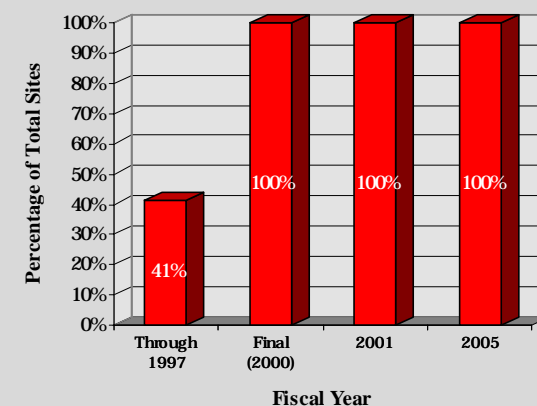
also completed Removal Actions at seven OUs. By the end of FY97, the installation will update its BRAC Cleanup Plan (BCP).

Community partnering continued through RAB efforts and regularly scheduled meetings. The BCT has implemented on-board reviews to expedite document review and site characterization.

## Plan of Action

- Transfer approximately 214 acres on the northernmost portion of the facility to the U.S. Department of the Interior in FY98
- Continue all Remedial Actions so that all reuse land parcels can be transferred by FY00
- Through FY98, continue BCT on-board reviews of documents to expedite decision-making
- In FY98, implement training of RAB members to foster partnerships with other regulatory agencies

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**Size:** 936 acres, including 493 acres on land and 443 acres submerged

**Mission:** Repaired and maintained ships

**HRS Score:** 48.77; placed on NPL in November 1989

**IAG Status:** Federal Facility Agreement signed in September 1990 and revised in January 1992

**Contaminants:** Heavy metals, PCBs, petroleum hydrocarbons, VOCs, and SVOCs

**Media Affected:** Groundwater, surface water, sediment, and soil

**Funding to Date:** \$118.6 million

**Estimated Cost to Completion (Completion Year):** \$283.8 million (FY2005)

**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2005



San Francisco, California

## Restoration Background

In July 1991, the BRAC Commission recommended closure of this installation. The station ceased operations on April 1, 1994, is in caretaker status, and is the responsibility of the Naval Facilities Engineering Command's Engineering Field Activity West. Parts of the installation have been leased to private parties.

The installation revised its approach to investigating and remediating sites and divided the property into six geographic areas, Parcels A through F, to facilitate studies, cleanup, and transfer of the property. Environmental studies identified 78 CERCLA sites. Site types include landfills and land disposal areas containing primarily heavy metals and volatile organic compounds (VOC), which are affecting groundwater, surface water, sediment, and soil.

The installation has removed contaminated soil from Sites 1, 2, 4, 6, 8, and 11. No further action was recommended for 14 sites. In FY91 and FY93, 36 underground storage tanks (UST) were removed and 10 were closed in place. The installation successfully demonstrated an innovative technology for recycling sand-blasting grit that contained low levels of copper and lead generated by ship cleaning operations. A full-scale demonstration was completed in FY93, allowing the Navy to use the technology at other installations. A three-phase Ecological Risk Assessment is under way at the installation. The first phase has been completed.

In FY95, the installation completed the land reuse plan and the Remedial Investigation and Feasibility Study (RI/FS) for Parcel A. The installation also began removing equipment, sunken baths, aboveground structures, foundations, and contaminated soil from Site 9.

A BRAC cleanup team (BCT), formed in FY94, has helped improve communication and build partnerships among the installation, EPA, and the state. The BCT also has expedited cleanup; for example, small areas of contamination now can be excavated during investigation, eliminating the need to return to the site. The installation prepared its BRAC Cleanup Plan (BCP) in FY94 and updates it regularly.

The installation prepared a community relations plan (CRP) in FY89. The technical review committee was converted to a 33-member restoration advisory board (RAB) in FY94. The RAB meets monthly. In FY95, the installation renegotiated the schedule set forth in the Federal Facility Agreement (FFA) to include schedules for Parcels A through F.

In FY96, the installation completed the basewide Environmental Baseline Survey (EBS) and continued revising the CRP. A Record of Decision (ROD) for no further action was signed for Parcel A. The installation initiated Removal Actions at Parcels B, C, D, and E while considering a groundwater pump-and-treat system for a contaminated plume and excavation and disposal for an exploratory excavation site.

## FY97 Restoration Progress

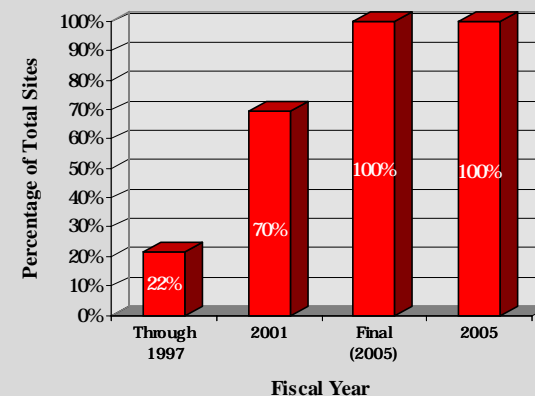
The revised CRP and the latest BCP were completed. Early actions for Sites 1, 3, 6, 9, 50, and 57 were completed at the installation. FFA schedules were renegotiated to accommodate budget shortfalls and to facilitate technical solutions. For expediting fieldwork, the installation used field variances and technical scopes. The installation also continued to support the RAB and held an open house with site tours.

Some activities scheduled for completion in FY97 were delayed because of funding restrictions.

## Plan of Action

- Sign RODs and begin and complete the Remedial Designs for Parcels B and D in FY98
- Complete the RI/FS for Parcel C and sign the ROD in FY98
- Update basewide EBS in FY98
- Complete all Removal Actions at Parcels B, C, D, and E in FY98
- In FY98, complete Engineering Evaluation and Cost Analysis and an Action Memorandum and begin fieldwork for Site 3
- In FY98, complete formal agreement with San Francisco to transfer Parcel A and execute lease in furtherance of conveyance
- Complete the RI/FS for Parcel E in FY98 and sign the ROD in FY99
- Install a landfill cover in FY03

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**Size:** 3,423 acres (923 acres at Stump Neck Annex)

**Mission:** Conduct research, development, and production of rocket and torpedo propellants and explosives

**HRS Score:** 50.00; placed on NPL in February 1995

**IAG Status:** None

**Contaminants:** Waste propellants, explosives, acids, paints, solvents, heavy metals, low-level radioactive material, and industrial wastewater

**Media Affected:** Groundwater, surface water, sediment, and soil

**Funding to Date:** \$7.8 million

**Estimated Cost to Completion (Completion Year):** \$53.8 million (FY2013)

**Final Remedy in Place or Response Complete Date:** FY2012



Indian Head, Maryland

## Restoration Background

This installation produces and handles complex chemicals to accomplish its mission. The main facility covers about 2,500 acres. The acreage at the Stump Neck Annex was not included in the National Priorities List (NPL) listing. Lead, silver, and mercury are the primary contaminants of concern.

A Preliminary Assessment (PA) completed in FY83 identified 29 potential CERCLA sites. Three of the sites were recommended for further study on the basis of available historical information. A supplemental PA prepared in FY92 identified an additional 17 potential sites, bringing the total number to 46. Two of those sites were recommended for no further study. The installation has conducted Site Inspections at 32 sites. Two additional sites were identified in FY94, bringing the total number of sites to 48.

The installation has completed Removal Actions at the X-Ray Building site and the Building 766 site. Soil at the X-Ray Building is contaminated with silver. To prevent further migration of contaminants, the contaminated soil in two swales was remediated. Soil at Building 766 is contaminated with mercury. A Site Characterization Report and an Engineering Evaluation and Cost Analysis for the Removal Action were completed. A weir was installed at the discharge point of a pond to prevent migration of mercury farther downstream. A Removal Action is under way to remove lead-contaminated soil at Site 56 (Building 790).

In FY91, the U.S. Fish and Wildlife Service completed a study of mercury levels in fish from Mattawoman Creek, which receives runoff from a large part of the facility. The study concluded that the concentration of mercury in fish at the installation was comparable to typical concentrations found in fish throughout Maryland.

In FY95, the installation completed the Removal Action at the X-Ray Building site and published the Removal Action report. The installation also completed the Removal Action to excavate mercury-contaminated soil at the Building 766 site. Biomonitoring conducted in the downstream pond indicated that the mercury had no adverse effect on fish. The installation also is conducting a Removal Action to remove trichloroethene (TCE) and treat TCE-contaminated groundwater at Site 57 (Building 292).

The installation formed a technical review committee in FY93 and converted it to a restoration advisory board (RAB) in FY95. The community is actively involved in the 14-member RAB, which meets quarterly. The installation has prepared a community relations plan and established an information repository at a nearby library.

During FY96, the installation hosted the RAB meetings and a tour of the Site 56 Removal Action. The installation also initiated Remedial Investigation/Feasibility Study (RI/FS) activities for 14 sites, completed fieldwork for the removal of lead-contaminated soil at Site 56, initiated project closeout reports to conclude the Site 56 Removal Action, and continued to treat TCE-contaminated groundwater at Site 57.

## FY97 Restoration Progress

Innovative technologies and fieldwork techniques were implemented, including soil vapor extraction and a geoprobe. The installation is planning to use the geoprobe to collect groundwater samples and is planning to use a magnetometer to delineate the extent of the landfill at Site 12 during the RI.

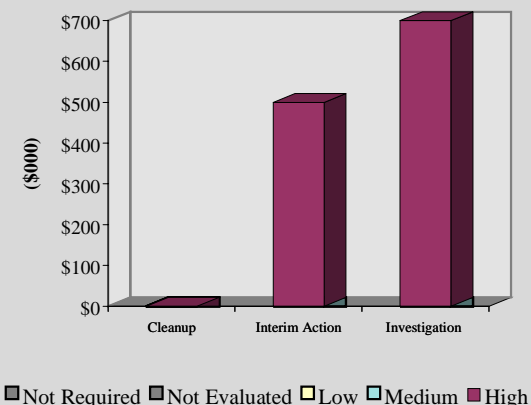
Work groups have been established for document review to ensure that all issues and solutions are understood and agreed to by all

parties. Effective communication with regulators was maintained through regular contact and discussions of issues.

## Plan of Action

- Continue the Interim Remedial Action for treating contaminated groundwater at Site 57 in FY98
- Initiate the RI/FS at Site 57 in FY98
- Establish partnerships with Maryland Department of Environment, EPA, and the Navy in FY98
- Complete RI/FS activities for 14 sites in FY99
- Perform bioremediation of Site 57 by FY01
- Use presumptive remedies for a municipal landfill and volatile organic compounds in soil by FY01-FY02

## FY98 FUNDING BY PHASE AND RELATIVE RISK





**Size:** 163 acres

**Mission:** Conduct research, development, engineering, and limited manufacturing of aviation electronics and of missile, space-borne, undersea, and surface weapons systems, and related equipment

**HRS Score:** NA

**IAG Status:** None

**Contaminants:** Solvents, degreasers, alcohol, chemical laboratory waste, pesticides, wastewater, heavy metals, acids, petroleum/oil/lubricants, and VOCs

**Media Affected:** Groundwater and soil

**Funding to Date:** \$0.4 million

**Estimated Cost to Completion (Completion Year):** \$1.8 million (FY2003)

**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY1999



## Indianapolis, Indiana

### Restoration Background

Indianapolis Naval Air Warfare Center, Aircraft Division (NAWCAD) was commissioned in 1942 as a Naval ordnance plant. In later years, its mission was redefined to add space, undersea, and surface weapons. Typical operations conducted at the facility in support of this mission included machining; electroplating; degreasing of metal parts; carpentry; painting; operation of photographic laboratories; testing and evaluation; destruction of documents; and storage of supplies, materials, and fuels.

In July 1995, the BRAC Commission recommended closure of NAWCAD. Various functions, along with personnel, equipment, and related support, are to be relocated, primarily to three Naval activities: Naval Surface Warfare Center, Crane, Indiana; NAWCAD, Patuxent River, Maryland; and Naval Air Warfare Center, Weapons Division, China Lake, California. The closure of this major technical center and the relocation of its principal functions reduces excess capacity, while raising aggregate military value.

The installation completed a Preliminary Assessment in FY88. In FY90, two underground storage tank (UST) sites were identified. In FY92, Site Assessments were completed at the two sites, and both were designated Response Complete. In FY96, the installation delineated Site 1 and began a Remedial Investigation and Feasibility Study (RI/FS). In addition, 18 areas of concern (AOC) were identified, and sampling began. In FY95, the installation initiated an Environmental Baseline Survey (EBS).

The installation's BRAC cleanup team (BCT) was established in FY96. A restoration advisory board (RAB) was also established and met monthly. The installation established an information repository and worked with the RAB during FY96 to complete a community relations plan.

In FY96, the NAWC Indianapolis Reuse Planning Authority (NAWC-RPA) was established and completed a preliminary privatizing business plan. The Navy signed a lease with the city of Indianapolis during FY96 and completed the transfer of operations to a private entity in FY97.

During FY96, fieldwork for the EBS was completed. The final EBS report identified 38 AOCs that required further investigation. The 38 AOCs were consolidated into 18 AOCs and 16 UST sites (compliance). The installation began the RI/FS at Site 1 and undertook sampling at the 18 AOCs.

### FY97 Restoration Progress

The RI/FS for Site 1 and the initial investigation of 18 AOCs were completed. The Remedial Design (RD) at Site 1 and the tank removal were initiated. A draft baseline Human Health and Ecological Risk assessment and the BRAC Cleanup Plan were completed. Use of portable gas chromatography, direct push sample collection, and immunoassay test kits helped accelerate fieldwork.

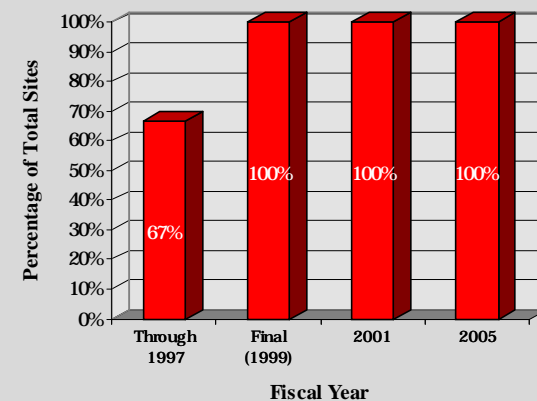
The closure of the Hazardous Waste Transfer Facility was completed in June 1997. Partnering meetings including regulators, site contractors, and Navy and facility representatives were held to review analytical data and develop conclusions and direction for document review. A RAB was formed, which participated in risk assessment training for RAB members, review of technical documents, and facility tours.

Plans to use in situ soil treatment by oxidation have been developed, and use of data quality objectives continued. The BCT has implemented an environmental justice program for minority and disadvantaged citizens who live in the NAWC vicinity.

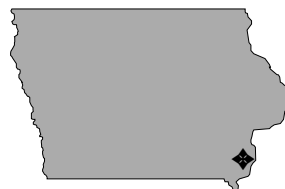
### Plan of Action

- Transfer property in FY98
- Complete RD and begin Remedial Action (RA) at Site 1 in FY98
- Complete RD and begin RA at some or all of the 18 AOCs in FY98
- Complete final baseline Human Health and Ecological Risk Assessment in FY98

### SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**Size:** 19,127 acres  
**Mission:** Load, assemble, and pack munitions  
**HRS Score:** 29.73; placed on NPL in August 1990  
**IAG Status:** IAG signed in December 1990  
**Contaminants:** Explosives, heavy metals, and VOCs  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$35.8 million  
**Estimated Cost to Completion (Completion Year):** \$101.5 million (FY2005)  
**Final Remedy in Place or Response Complete Date:** FY2005



*Middletown, Iowa*

## Restoration Background

In 1941, the Army constructed the Iowa Army Ammunition Plant to load, assemble, and pack various conventional ammunition and fusing systems. During operations, industrial process wastewaters and by-products were disposed of at the installation. Site types include surface impoundments, production areas, landfills, and a fire training pit. Soil and groundwater contamination resulted primarily from disposal of explosives and heavy metal-containing wastes directly on soil. The installation also identified minor amounts of contamination by volatile organic compounds (VOC).

Environmental studies, beginning in the early 1980s, identified 40 restoration sites. Of the 40 sites, 33 required further study. In FY92, Remedial Investigation and Feasibility Study (RI/FS) activities began. In FY96, the installation completed its RIs.

Restoration activities through FY96 included closing one cell in the inert landfill, removing aboveground treatment tanks, removing lead-contaminated soil from a production line, and cleaning up an abandoned coal storage yard. The installation, in coordination with the local public water utility, funded a project connecting local residences to a public water supply. More recent restoration activities involved excavation and off-site incineration of pesticide-contaminated soil and excavation of explosives-contaminated sumps. The installation created three operable units (OU)—a soil OU, an interim soil OU, and a groundwater OU—to better manage the restoration efforts.

In FY96, the installation submitted the final revised RI Report to EPA Region 7 and began excavation of explosives-contaminated soil from the two surface impoundments. At the inert landfill, the installation constructed a new RCRA cell; however, capping did not occur, because surface impoundment material and solid waste management

unit (SWMU) material are still being placed in the landfill. The installation also consolidated the remaining RI/FS sites into more manageable OUs, including a Soil OU and a Groundwater OU.

## FY97 Restoration Progress

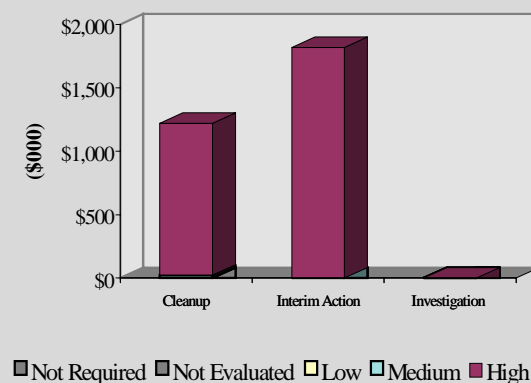
The Army removed over 80,000 cubic yards of contaminated soil from the former Line 1 impoundment area and the Line 800 lagoon. It created wetlands and began phytoremediation to clean residual contamination. The removed soil was placed in different locations at the inert landfill according to level of contamination. The inert landfill is undergoing closure action. The installation is holding the most highly contaminated soil in a designated corrective action management unit until it determines the most effective method of treatment. The Army continued its demonstration of aerobic and anaerobic bioslurry techniques at the installation. Other methods of remediating explosives-contaminated soil are also being reviewed and demonstrated at the installation through cooperative efforts of the Army, EPA, the University of Iowa, the U.S. Fish and Wildlife Service, and private entities.

The installation has been increasing community awareness through meetings and slide presentations with the installation's restoration advisory board (RAB), the public, and the news media. Monthly project management team meetings are held with EPA Region 7, the U.S. Army Corps of Engineers, and the Army Environmental Center.

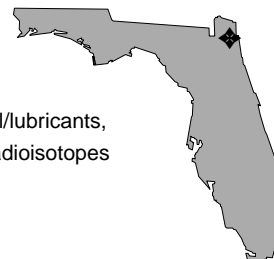
## Plan of Action

- Complete a Record of Decision (ROD) to address groundwater remediation, complete interim soil ROD, and partially cap inert landfill by FY98
- Complete a ROD to address soil remediation by FY98, pending selection of innovative technology
- Cap the RCRA landfill in FY98
- Conduct cleanup of various small sites in FY99

## FY98 FUNDING BY PHASE AND RELATIVE RISK



|   |   |
|---|---|
| <b>Size:</b>  | 3,820 acres   |
| <b>Mission:</b>   | Maintain and operate facilities; provide services and materials to support aviation activities and aircraft overhaul operations   |
| <b>HRS Score:</b>                                       | 31.02; placed on NPL in November 1989   |
| <b>IAG Status:</b>                                      | Federal Facility Agreement signed in October 1989   |
| <b>Contaminants:</b>                                    | Waste solvents, acids and caustics, cyanide, heavy metals, petroleum/oil/lubricants, low-level radioactive wastes, oil, paint, PCBs, pesticides, phenols, and radioisotopes |
| <b>Media Affected:</b>                                  | Groundwater, surface water, sediment, and soil  |
| <b>Funding to Date:</b>                                 | \$54.2 million  |
| <b>Estimated Cost to Completion (Completion Year):</b>  | \$71.7 million (FY2016)   |
| <b>Final Remedy in Place or Response Complete Date:</b> | FY2014  |



*Jacksonville, Florida*

## Restoration Background

Jacksonville Naval Air Station includes the following site types: fire training areas, waste storage and disposal areas, transformer storage areas, radioactive-waste disposal areas, and other miscellaneous support and maintenance areas. Typical operations have generated solvents, sludge (from on-site treatment plants), and low-level radioactive waste, which have migrated into nearby soil and local groundwater supplies.

There are 47 CERCLA sites, 16 underground storage tank (UST) sites, and 3 RCRA solid waste management units (SWMU) at the installation. The installation has completed Preliminary Assessments (PA) for 40 sites and Site Inspections (SI) for 42 sites. Currently, 15 sites have proceeded to the Remedial Investigation and Feasibility Study (RI/FS) phase.

To expedite the cleanup process, three operable units (OU) were defined. OU1 consists of two disposal pits, OU2 consists of six sites known as the Wastewater Treatment Plant Area, and OU3 consists of six sites known as the Industrial Area.

During three Interim Remedial Actions (IRA) in FY94, the installation erected fences at five sites and removed soil from one. A Record of Decision (ROD) has been signed for two sites. An Interim ROD was signed for one site in FY95.

To facilitate cleanup, the installation developed a Remedial Response Decision System (RRDS), which establishes guidelines and criteria for evaluating existing site data and proposing remedial response activities. The installation has developed partnerships with EPA, the Florida Department of Environmental Protection, contractors, and the Naval Facilities Engineering Command to accelerate the cleanup

process. Better communication among team members has reduced the time required to review documents and plan activities.

The installation formed its technical review committee in FY88 and converted it to a restoration advisory board (RAB) in FY95. The RAB meets monthly. In FY91, the installation completed its community relations plan and established an administrative record and an information repository. The installation also has published and distributed 17 fact sheets.

During FY96, the installation continued RI/FS activities at six sites and completed two IRAs. It completed PA/SIs for three sites, RI/FSs for two sites, and Engineering Evaluation and Cost Analyses (EE/CA) for six sites. During FY96, the installation also completed the design and implementation for UST 1. The deep plume at UST 1 received a designation of no-further-action and a Site Assessment, two closure action plans, and an Interim Remedial Action (IRA) were completed for UST sites. For two UST sites, monitoring-only plans were approved during FY96, and corrective measures implementation (CMI) was completed at one SWMU site. Five IRAs were initiated in FY96.

## FY97 Restoration Progress

The installation completed the Remedial Design and Remedial Action (RA) for OU1. The corrective action and the IRA for UST 1 were completed, and a monitoring-only plan was implemented at UST 10. IRAs for Site 18 and SWMU 2 were completed. The long-term monitoring (LTM) was initiated for SWMU 2 as well.

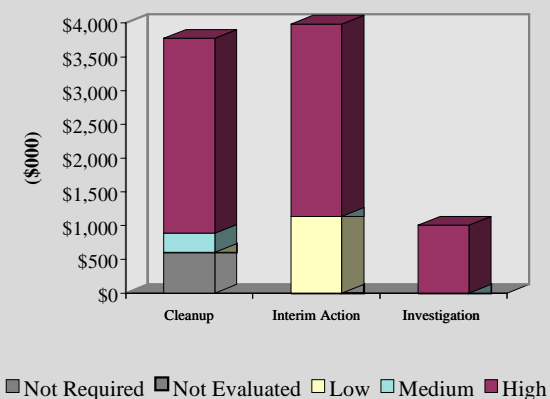
The RAB continued to meet monthly and to receive input and information from the Navy. The RAB also received monthly training. The Naval Air Station Jacksonville partnering team continued to work together to meet station cleanup goals.

Some activities scheduled for completion in FY97 were delayed because other projects prevented compliance with accelerated review cycles.

## Plan of Action

- Conduct a Baseline Risk Assessment and complete RI/FS activities for OU2 in FY98
- Begin LTM at UST 1 in FY98
- Complete RI/FS at six sites and continue RI/FSs at six other sites in early FY98
- Complete one PA/SI, one IRA, and two RAs in FY98
- Continue six RI/FSs in FY98
- Complete one corrective action plan and one corrective action in FY98
- Complete the CMI and IRA for SWMU 1 in FY98

## FY98 FUNDING BY PHASE AND RELATIVE RISK



**Size:** 55,270 acres  
**Mission:** Perform production acceptance testing of ammunition, weapons, and their components  
**HRS Score:** NA  
**IAG Status:** None  
**Contaminants:** Solvents, petroleum products, VOCs, PCBs, heavy metals, depleted uranium, and UXO  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$18.5 million  
**Estimated Cost to Completion (Completion Year):** \$22.3 million (FY2021)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2002



## Madison, Indiana

### Restoration Background

In December 1988, the BRAC Commission recommended closure of the Jefferson Proving Ground in Madison, Indiana, and relocation of the installation's mission to Yuma Proving Ground in Arizona. The installation was closed on September 30, 1995.

Sites identified during environmental studies included landfill and disposal areas, hazardous waste storage areas, fire training areas, underground storage tanks (UST), and buildings with asbestos-containing materials. Contaminants present at the installation include depleted uranium, heavy metals, unexploded ordnance (UXO), solvents, polychlorinated biphenyls (PCB), volatile organic compounds (VOC), and petroleum hydrocarbons. Interim Actions include installation of a landfill cap, removal of USTs, and excavation of contaminated soil.

In FY94, the installation submitted the draft Phase I Remedial Investigation (RI) Report for sites south of the firing line. In response, the regulatory agencies requested additional studies to further characterize contaminants at those sites. Phase II RI data collection began in FY96 and continued into FY97.

In FY94, a finding of suitability to lease (FOSL) report and a finding of suitability to transfer (FOST) report were prepared for two portions of the installation's property. The Army also conducted a field demonstration in which innovative technologies were used to locate mock ordnance items in subsurface soil. Two additional FOST reports were completed in FY96.

Interim Actions conducted at the installation during FY95 included removal of 18 USTs, treatment of contaminated soil in Bioremediation Cell No. 1, and construction of a landfill cap at Gate No. 19. Also in FY95, the installation surveyed and decontaminated depleted uranium

support facilities and began work plans for Interim Remedial Actions (IRA) at 10 sites in the south area.

The installation prepared a technical memorandum for approximately 23 sites. The restoration advisory board (RAB) expanded its membership by adding representatives of the Nuclear Regulatory Commission, the U.S. Fish and Wildlife Service, the Indiana Department of Health, the Madison Industrial Development Corporation, environmental contractors, and public interest groups. A Local Redevelopment Authority replaced the existing Redevelopment Board and worked to implement the land reuse plan.

In FY96, the installation submitted IRA work plans for 10 sites to the regulatory agencies and began cleanup activities. Phase II RI activities continued, and Phase II field sampling began. The Army completed the UXO survey work plan and began the UXO survey. The installation initiated long-term monitoring of the landfill at Gate No. 19. The Army leased approximately 3,400 acres of the containment area in "furtherance of conveyance," which will allow formal transfer within 5 years. In addition, 1.2 acres were transferred under a no-cost public conveyance.

### FY97 Restoration Progress

The Army completed FOST and FOSL reports for portions of the installation, in conjunction with the Record of Decision. The installation also initiated a facilitated partnership with regulators while enhancing community outreach with an updated community relations plan. Ten early actions were initiated. The installation held six RAB meetings, including a congressionally attended town hall meeting.

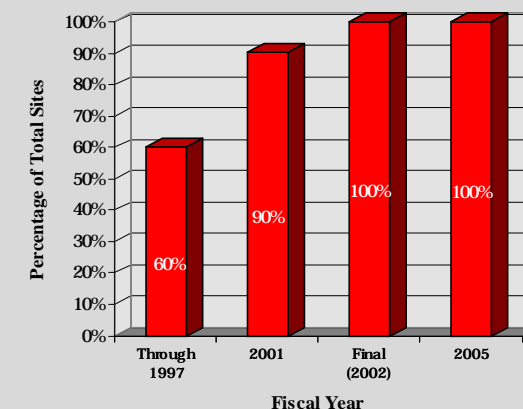
Delays in regulatory review, the need for additional fieldwork, and the need to resolve regulatory comments delayed completion of the

first four items in the current Plan of Action, which originally were scheduled for completion in FY97.

### Plan of Action

- In FY98, complete and submit the Phase II RI Report to the regulatory agencies for review
- Complete technical memorandums to eliminate sites from the RI in FY98
- Complete a work plan in FY98 for intrinsic bioremediation (natural attenuation) at solvent sites and submit the plan to the regulatory agencies for review
- Complete Ecological Risk Assessment field studies in FY98
- Form partnerships with Nuclear Regulatory Commission, U.S. Fish and Wildlife Service, and Indiana Department of Natural Resources in FY98
- Obtain regulatory concurrence for closure of open burning unit in FY98
- Complete Relative Risk Site Evaluations for the remaining 10 sites by FY00
- Complete all BRAC activities by FY20

### SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**Size:** 176 acres  
**Mission:** Conduct research and develop aeronautics, rocketry, and space exploration technology  
**HRS Score:** 50.00; placed on NPL in October 1992  
**IAG Status:** IAG between NASA and EPA signed in 1992  
**Contaminants:** VOCs and various inorganic chemicals  
**Media Affected:** Groundwater  
**Funding to Date:** \$0.6 million  
**Estimated Cost to Completion (Completion Year):** \$0.3 million (NA)  
**Final Remedy In Place or Response Complete Date:** NA



*Pasadena, California*

## Restoration Background

In 1980, samples from drinking water wells of the city of Pasadena were found to be contaminated with volatile organic compounds (VOC), including trichloroethane (TCA), trichloroethene (TCE), and tetrachloroethene (PCE). NASA and the California Institute of Technology Jet Propulsion Laboratory initiated an environmental study to determine whether the Jet Propulsion Laboratory was a potential source of the contaminants. A Preliminary Assessment and a Site Inspection were conducted, and an Expanded Site Inspection was completed in FY90.

On December 10, 1993, the Omaha District of the U.S. Army Corps of Engineers (USACE) proposed an Interim Settlement Agreement to NASA and the California Institute of Technology Jet Propulsion Laboratory for DoD participation in funding environmental restoration activities.

For study and cleanup, the laboratory site was divided into three operable units (OU): on-site groundwater contamination (OU1), on-site contamination sources (OU2), and off-site groundwater contamination (OU3). In addition, the installation identified eight waste disposal areas. NASA prepared and submitted a Remedial Investigation and Feasibility Study (RI/FS) work plan to EPA for approval. NASA is the lead agency for the RI.

In FY94, RI/FS activities began with the installation of groundwater monitoring wells at OU1. RI fieldwork at OU3 also was initiated. RI/FS activities continued during FY95 with a second sampling round for on-site soil vapor extraction wells.

In FY95, an Interim Remedial Action (IRA) was implemented. The IRA involved installation of a groundwater treatment system for

contaminated municipal wells. In the third quarter of FY95, five off-site groundwater monitoring wells were installed, and one round of groundwater samples was collected.

Early in FY96, NASA conducted a second round of groundwater sampling at five off-site monitoring wells. Three additional monitoring wells were installed to determine the direction of groundwater migration beneath the installation. Four soil-gas probes also were installed to determine the extent of vertical migration of contamination. NASA completed all off-site drilling at the installation.

## FY97 Restoration Progress

USACE conducted off-site quarterly well sampling and monitoring. Risk assessment analysis was developed. USACE also completed the on-site RI and began the FS in FY97. Pilot treatment plants for VOCs and perchlorates were implemented and may result in Interim Actions.

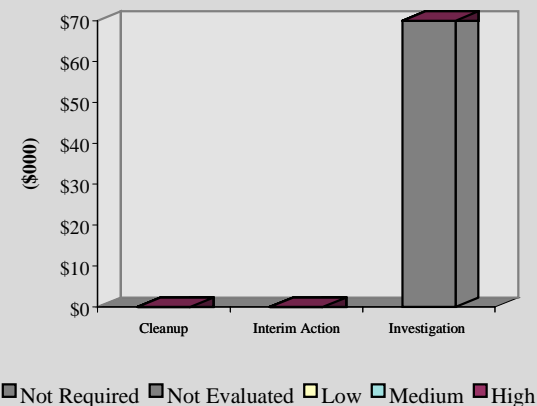
Some activities scheduled for completion in FY97 were delayed because of the discovery of an additional contaminant of concern, perchlorates, which previously could not be detected.

## Plan of Action

- Continue conducting off-site quarterly well sampling and monitoring in FY98
- Complete developing the risk assessment in FY99
- Complete the FS in FY99
- By FY00, determine DoD's liability upon receipt of NASA's response to the proposed Interim Settlement Agreement of December 10, 1993, which is under review by NASA

- Issue Record of Decision stipulating selection of appropriate environmental restoration alternatives upon completion of the RI/FS in FY99

## FY98 FUNDING BY PHASE AND RELATIVE RISK





**Size:** 23,544 acres  
**Mission:** Manufacture, load, assemble, and pack munitions and explosives  
**HRS Score:** 35.23 (Loading, Assembling, and Packing Area); placed on NPL in March 1989  
 32.08 (Manufacturing Area); placed on NPL in July 1987  
**IAG Status:** IAG signed in June 1989  
**Contaminants:** Explosives, heavy metals, VOCs, and PCBs  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$22.0 million  
**Estimated Cost to Completion (Completion Year):** \$177.1 million (FY2033)  
**Final Remedy in Place or Response Complete Date:** FY2004



### Wilmington, Illinois

### Restoration Background

The Army constructed Joliet Army Ammunition Plant (JOAAP) in the early 1940s. It served as one of the largest munitions and explosives manufacturers in the Midwest. Installation operations included manufacturing of explosives and loading, assembling, and packing (LAP) of munitions for shipment. The 14,385-acre LAP Area and the 9,159-acre Manufacturing Area have been placed on the National Priorities List (NPL).

Environmental studies conducted in FY88 identified 53 sites, including 35 in the LAP Area and 18 in the Manufacturing Area. Prominent site types in the two areas include ash piles, landfills, open burning and open detonation areas, and surface impoundments. The installation consolidated all sites into two operable units, one that addresses groundwater contamination and another for contamination of soil and sediment.

During an FY85 Interim Remedial Action (IRA), the Army removed more than 7 million gallons of explosives-contaminated water from the Red Water Lagoon. After disposing of the water off site, the Army dredged the lagoon, removed the sludge and liner and covered the entire area with a clay cap. IRA activities in FY93 included capping two ash piles. In FY94, a Phase II Remedial Investigation (RI) was completed for the Manufacturing Area and approved by the regulatory agencies.

In FY95, the Army completed the initial phase of a bioslurry reactor demonstration. For follow-up technology demonstrations, the Army began an informal partnership with a commercial company to exchange information about process enhancements. In the same year, a field screening effort was initiated to gather data to more accurately estimate the volume of explosives-contaminated soil. Tufts University and Argonne National Laboratory executed an adaptive sampling

demonstration for that effort. The installation also completed the Phase II RI for the LAP Area and this was approved by regulatory agencies.

In FY94, the Joliet Arsenal Citizen Planning Commission developed and approved a future land use plan for the installation. The plan identifies reuse initiatives and future owners of the site. A bill to implement the plan was submitted and was approved by Congress.

In FY95, the installation formed a restoration advisory board (RAB). The RAB has 20 members, who represent the area within a 250 mile radius of the installation.

In FY96, the RAB prepared a charter and elected officers. The Army completed an environmental screening of 15,000 acres to be transferred to the Forest Service, U.S. Department of Agriculture. A 982-acre parcel was transferred to the Department of Veterans Affairs.

The Army completed its bioslurry reactor demonstration. Regulatory agency approval was granted for the land application of the treated material. The installation set preliminary remediation goals for contaminated sites and received regulatory agency approval of those goals.

The installation conducted two significant Removal Actions: removal of more than 1,000 exterior-mounted, oil-filled electrical switches that contained polychlorinated biphenyls (PCB) and removal of 3 oil pits from the explosives burning ground. Some of the oils collected in the pits contained PCBs and had caused PCB contamination of the site. During FY96, the installation removed petroleum- and PCB-contaminated soil from Site L6 and cleared the ground for transfer to future owners.

### FY97 Restoration Progress

JOAAP provided a host site for USAWES for a field trial of explosives and metal probes for the Site Characterization and Analysis Penetrometer System (SCAPS) unit. Also, the Army completed Feasibility Studies (FS) at all active study sites for the Manufacturing and LAP Areas.

The RAB participated in the 97 Work Prioritization and remedy selection for the Removal Action for Site L6; hosted a media tour; and received specialized training on risk assessment, risk management, and risk communication.

Partnering efforts included cooperating with EPA and USAWES on a groundwater natural attenuation/phytoremediation study and inclusion of state and federal remedial project managers in review of internal draft reports

### Plan of Action

- Complete Proposed Plans and Record of Decision documents for all sites in FY98
- Transfer approximately 2,000 acres to the state of Illinois for industrial development and 455 acres to Will County for use as a landfill in FY98
- Identify additional land that is environmentally suitable for transfer in FY98
- Conduct competitive biotechnology demonstration in FY98 to select bioremediation process
- Initiate remedial actions for all sites in FY99

### FY98 FUNDING BY PHASE AND RELATIVE RISK

